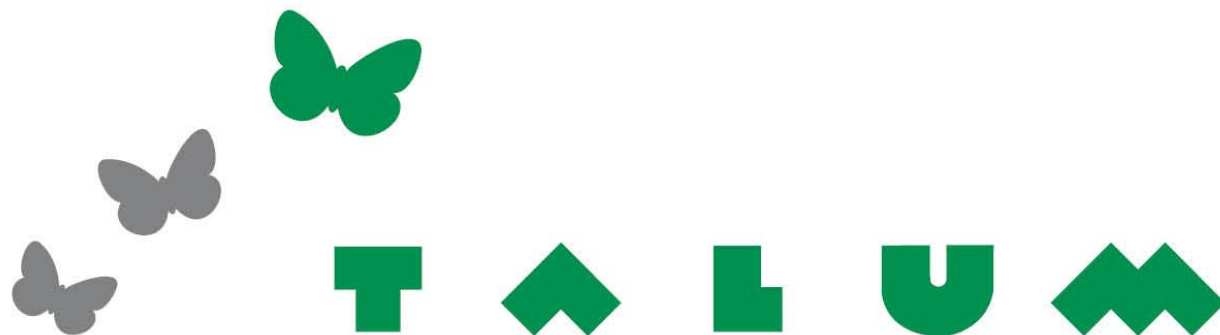




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APPLICATION OF THERMODYNAMIC SIMULATIONS IN THE DEVELOPMENT OF ALUMINIUM ALLOYS FOR PACKAGING APPLICATIONS

Haris Salihagić Hrenko



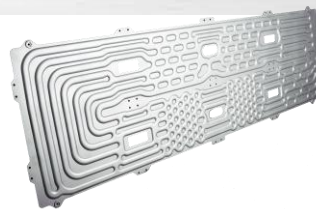
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ABOUT US



CASTINGS
12 %

EVAPORATORS
2 %



BILLETS
30 %



110,000 t

SLUGS AND DISCS
56 %





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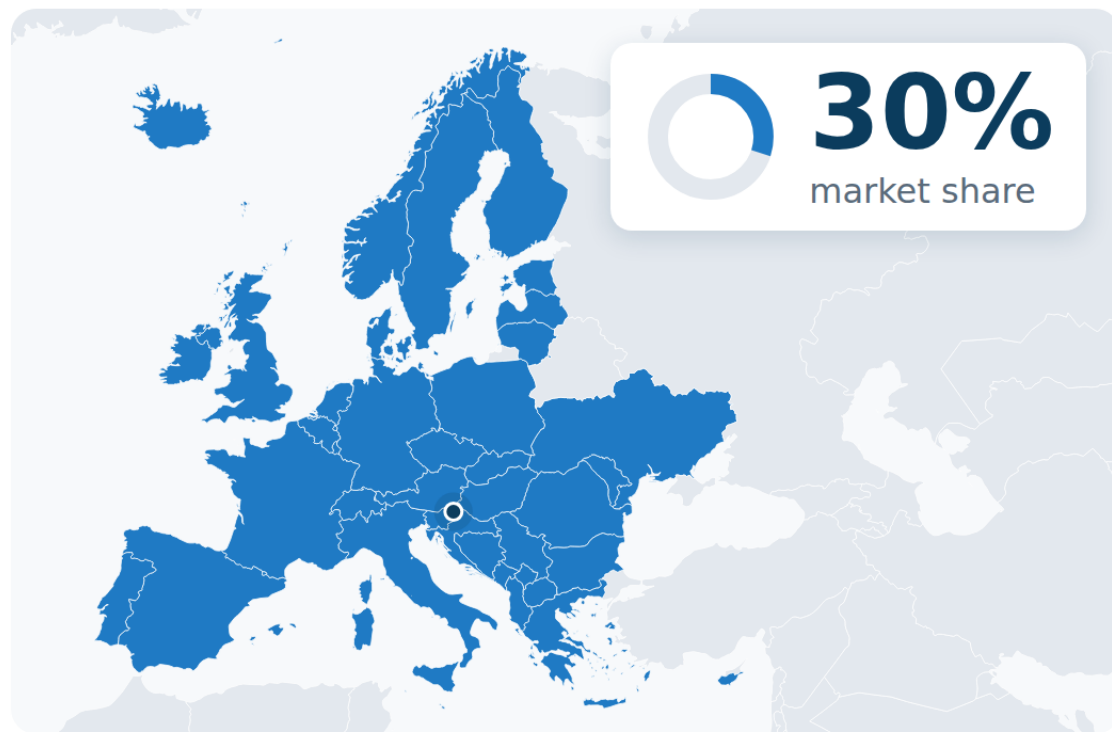
FROM SLUG TO AEROSOL CAN



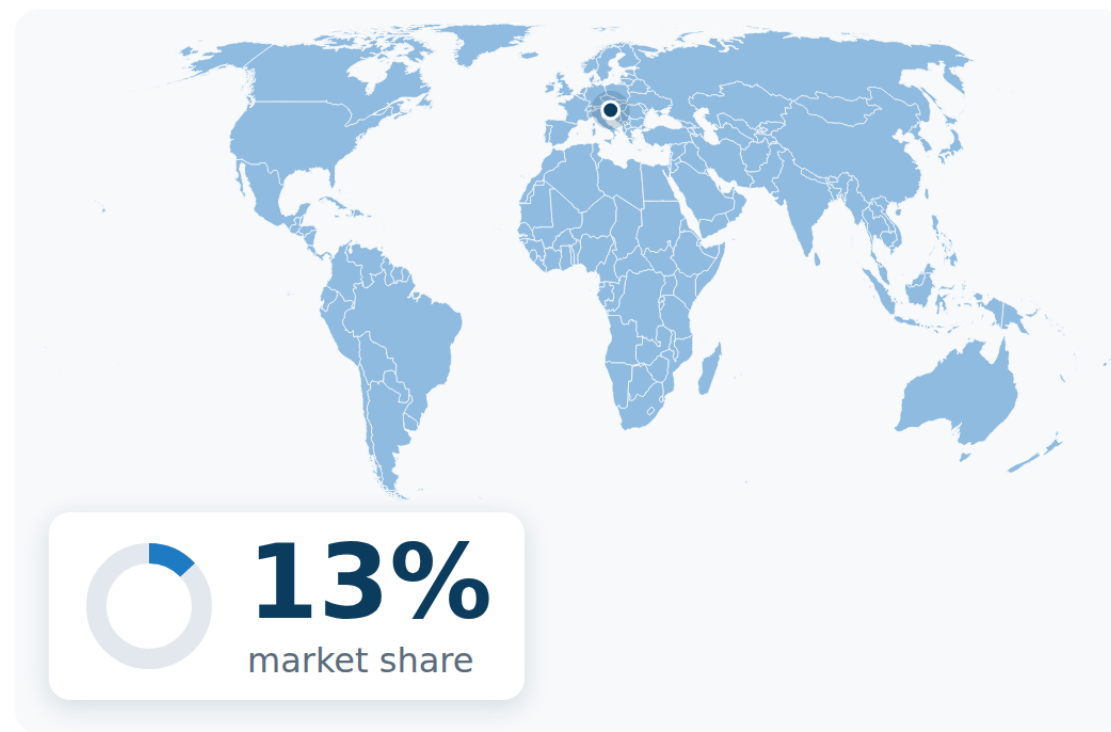


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INDUSTRIAL SCALE – 80,000 TONNES



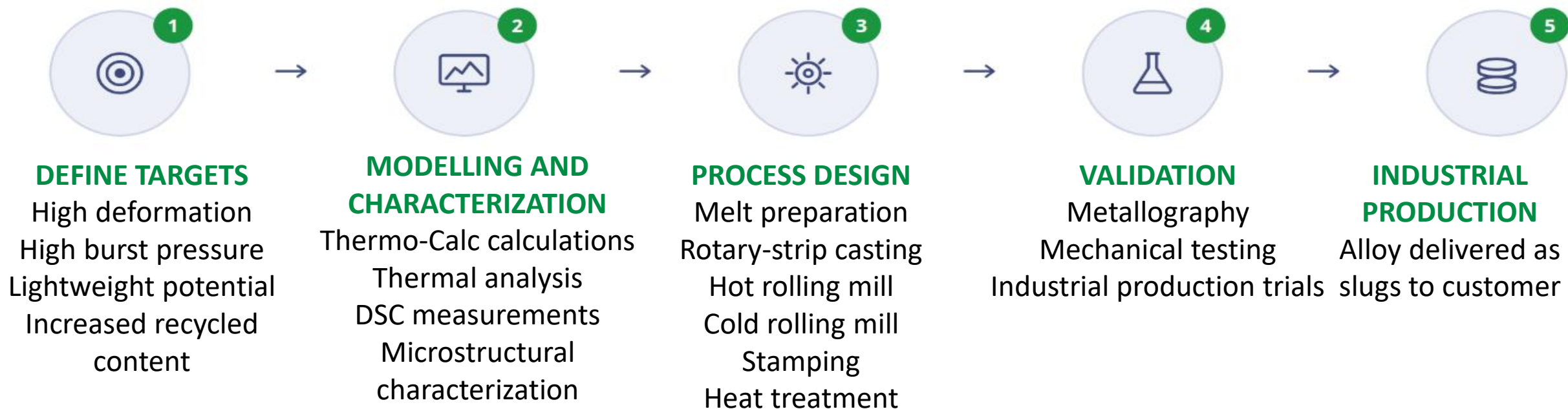
#1 in Europe



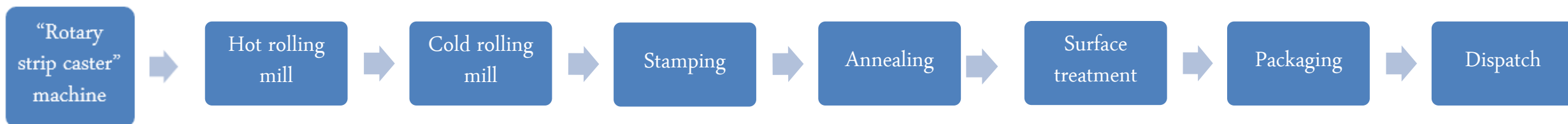
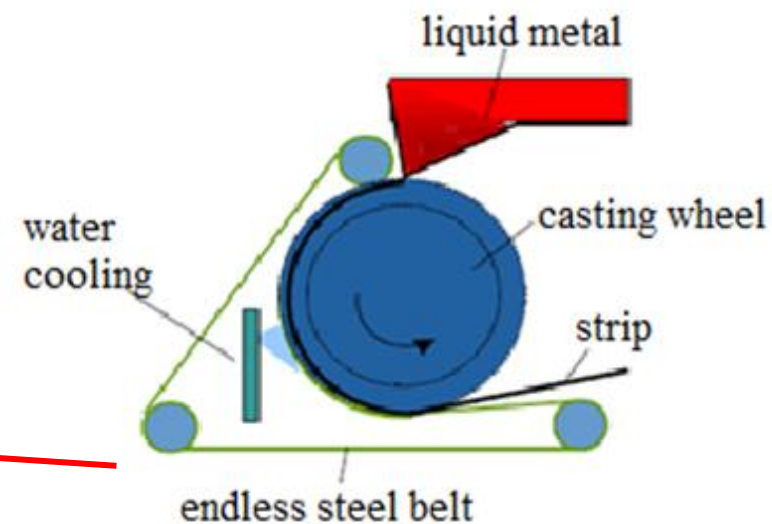
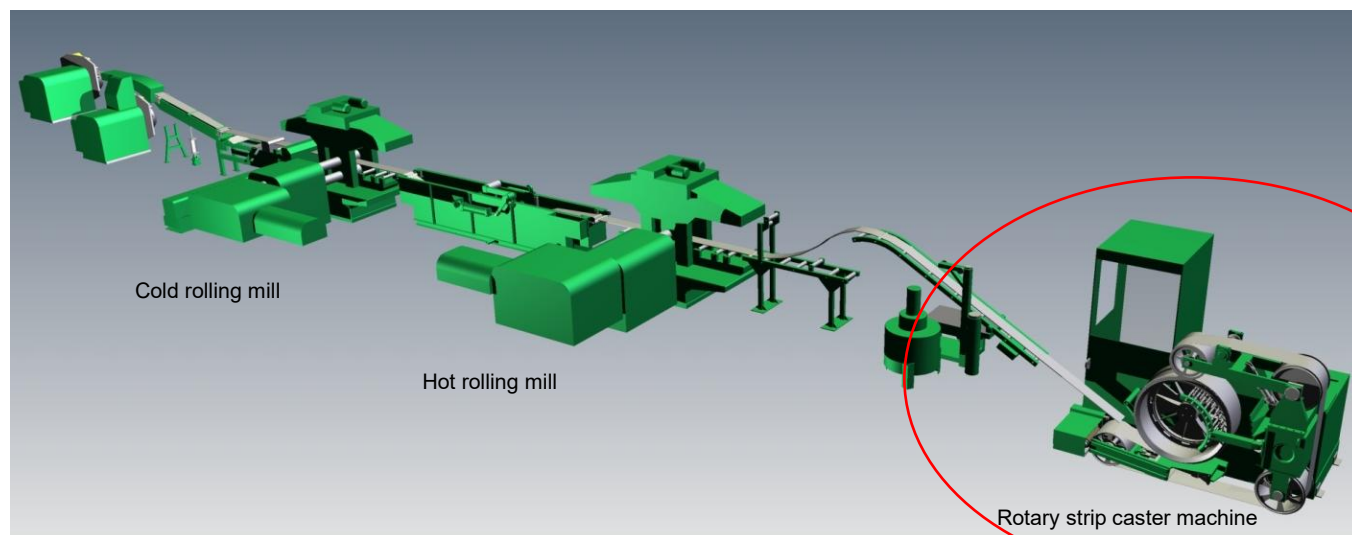
#1 in the World



THERMODYNAMIC SIMULATIONS – DEVELOPMENT PROCESS



INDUSTRIAL PROCESS ROUTE FOR HIGH-POST CONSUMER RECYCLED (PCR) ALLOYS



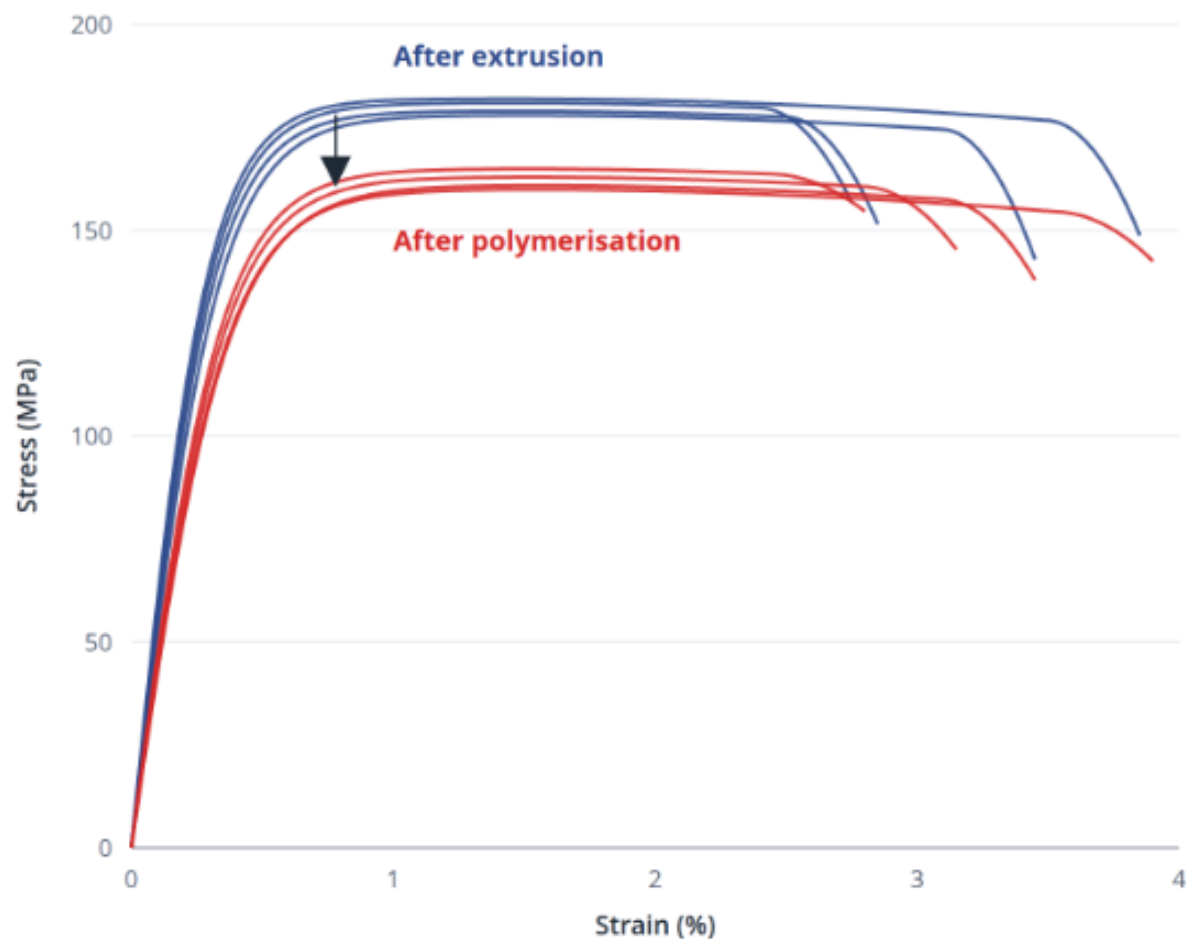


AEROSOL CAN PRODUCTION – FROM SLUG TO CAN

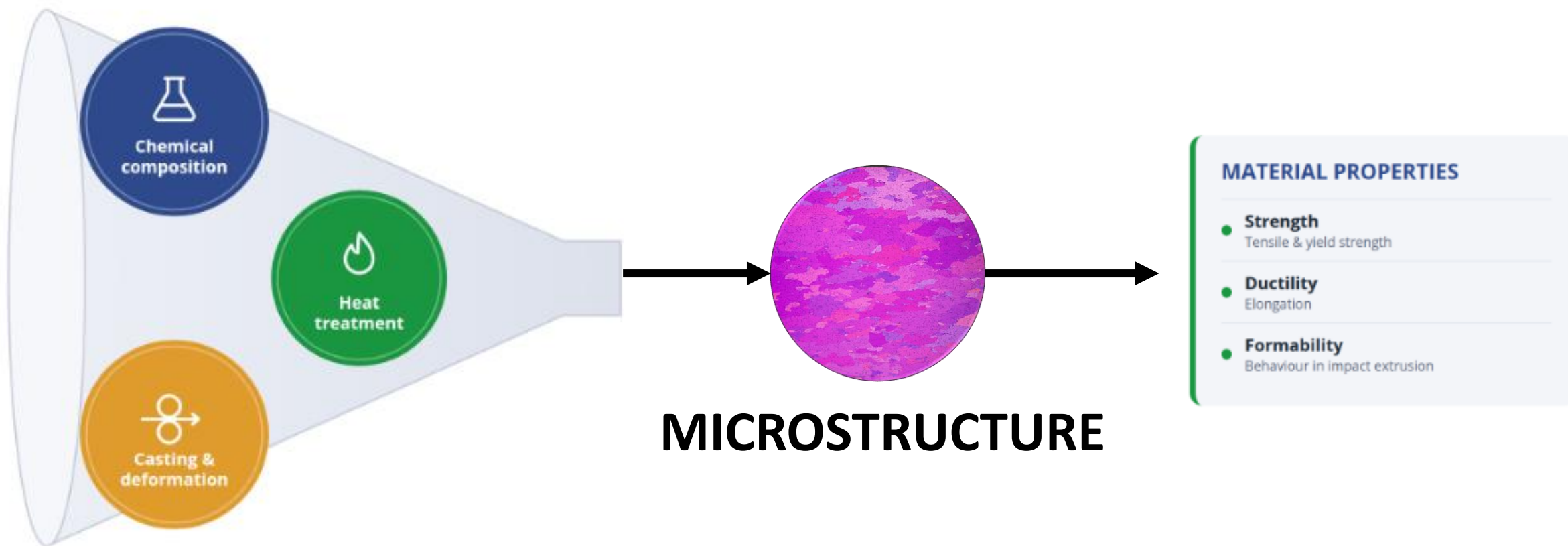




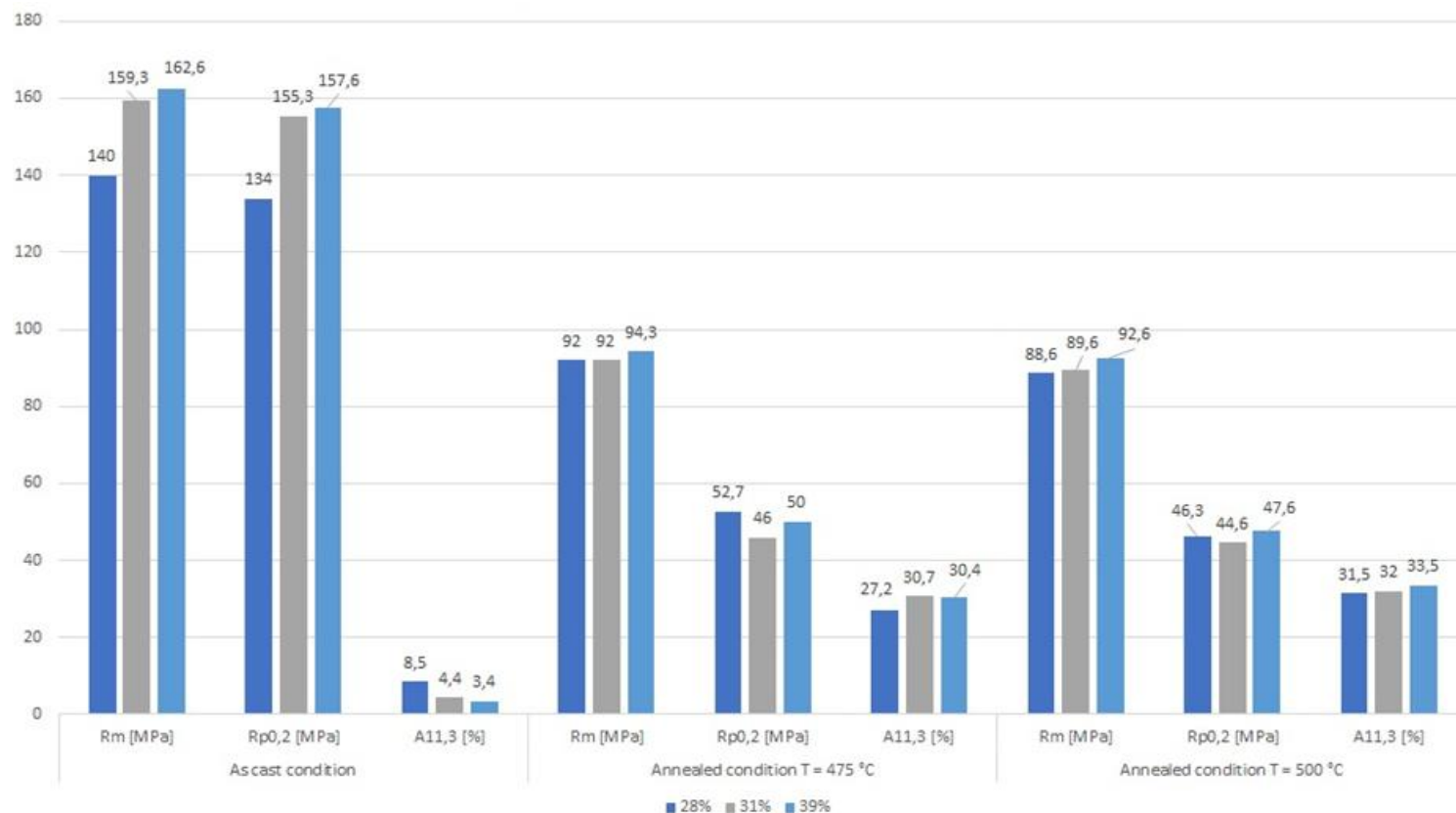
MECHANICAL PROPERTY LOSS AFTER POLYMERIZATION



FROM PROCESS PARAMETERS TO FINAL PROPERTIES

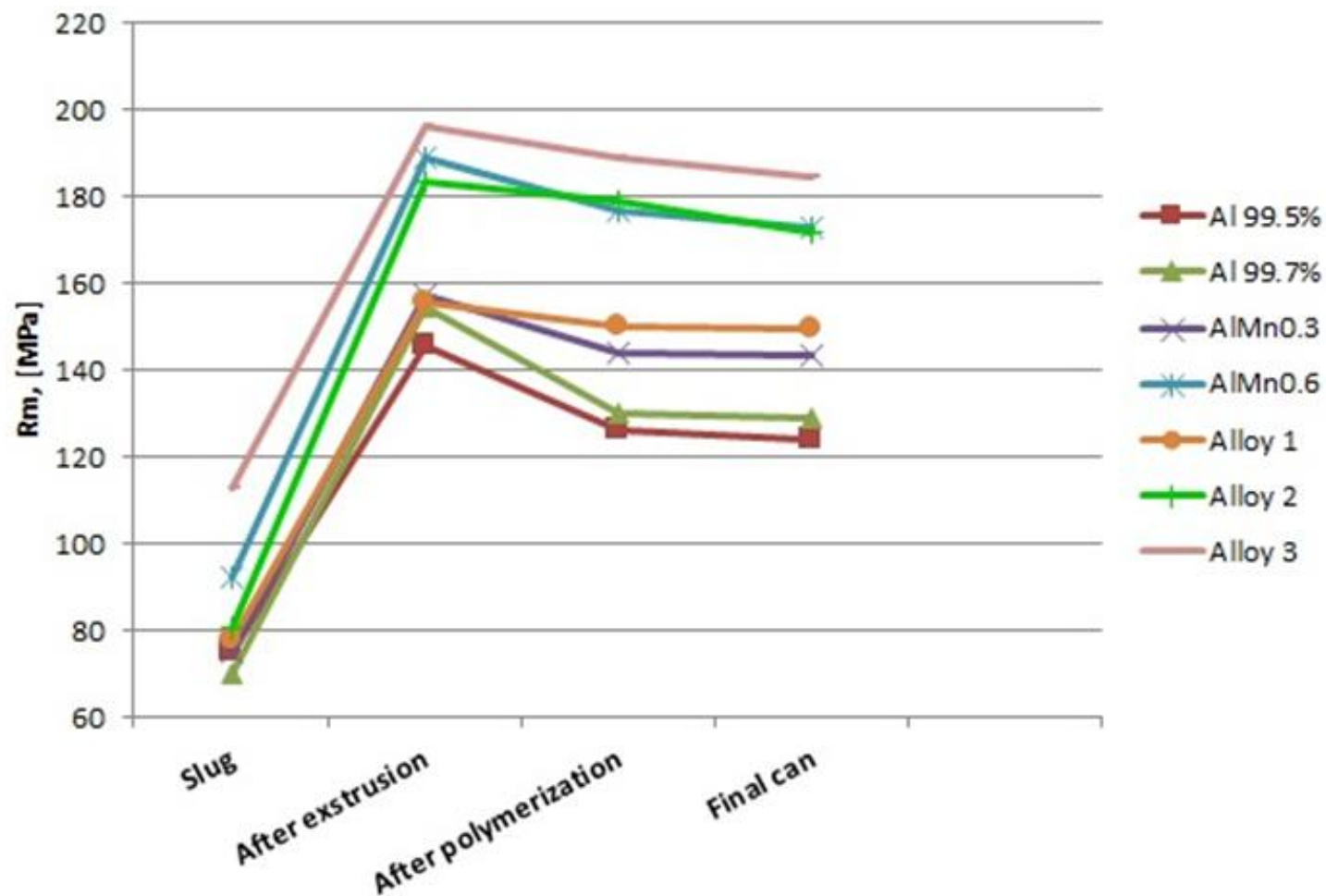


EFFECT OF COLD REDUCTION AND ANNEALING



- Higher cold reduction increases stored deformation energy
- Stored energy increases the driving force for recrystallization
- The annealing window must match the rolling history

IMPROVED PROPERTY RETENTION AND CAN PERFORMANCE

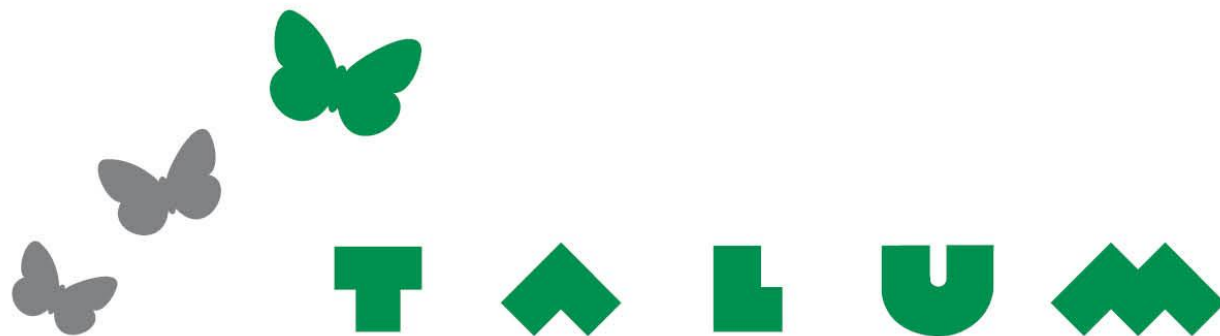


- Property loss after polymerization reduced to approximately 2–3%
- Customer trials showed 10–15% higher deformation and burst pressure
- Potential for thinner walls and reduced material consumption



SUMMARY

- Alloy chemistry and process parameters must be optimized together
- Thermodynamic modelling supports focused alloy screening
- Property loss after polymerization was reduced to approximately 2 – 3 %
- Customer trials demonstrated 10-15 % higher deformation and burst pressure
- The selected concept provides potential for lightweighting and increased recycled content



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Thank you for your attention.